THE ATOM

Los Alamos Scientific Laboratory

May, 1965

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ON THE COVER:

Dimly-lighted glass-walled tanks of gently bubbling water are an entire world to colonies of colorful and odd-shaped creatures like these in the close-up photo by Bill Regan. Other pictures and a report on these unusual LASL office fixtures that threaten the potted plant in popularity starts on page. 12.

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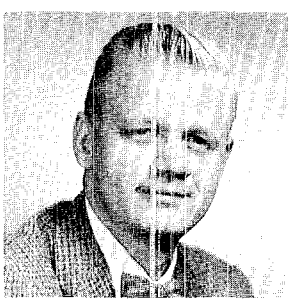
Short Subjects

G. Robert Keepin, N-2 staff member on leave with the International Atomic Energy Agency in Vienna, Austria, has written a book devoted to spanning the gulf between developments in fission physics and their application to fission reactor systems. The book, "Physics of Nuclear Kinetics," (Addison-Wesley Publishing Co., Inc., Reading, Mass.) has been praised by nuclear scientist-reviewers and has been made a part of the publisher's Series in Nuclear Science and Engineering. Keepin points out the fields of fission physics and reactor kinetics have tended to develop divergently and "in some instances, years have elapsed between the discovery of significant new fission physics data and their ultimate application to reactor problems." Keepin, who with his family will return to Los Alamos in late summer, has been with IAEA since the spring of 1963, as head of the Physics Section in the Division of Research and Laboratories and has also served as scientific secretary for a number of international technical meetings that have been held in Europe under IAEA sponsorship.



KEEPIN

Charles A. Lehman, Sr., T-5, has been consulting with the University of Arizona's Steward Observatory on the use of the LASL computer program for lens design. The program, first prepared in 1959 by John Holladay, will be used in a reflecting telescope at the observatory.

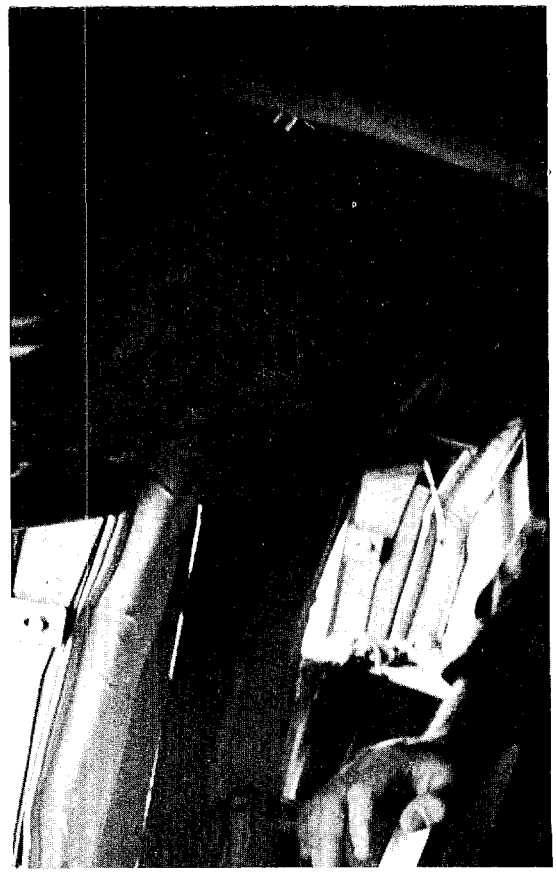
The final 141 lots to be developed by the Atomic Energy Commission on Barranca Mesa will be sold during May. The drawing for lot selection priority was scheduled for May 3, at the AEC Area Office Headquarters Building. Selection and purchase are scheduled to start May 5. The new lots are east of the Barranca Mesa Elementary School. Eleven of the lots are on an extension of Loma del Escolar, in Subdivision No. 3, and the other 130 make up Subdivision No. 4. Development of Barranca Mesa was begun by the AEC in 1958.

New nationwide regulations concerning the use of certain national parks, forests, wildlife refuges, monuments and other outdoor recreational areas went into effect April 1. Most notable innovation is establishment of a $7 annual fee that buys entry to most Federal recreational areas for a non-commercial vehicle and all its occupants (including a trailer that might be in tow). The new regulations also authorize daily and weekly entry fees and certain use fees and authorize their collection at many recreational areas formerly in the "free" category. Of local interest is access to Bandelier National Monument. The $7 fee, which acquires a 3-inch-square sticker, will be honored as a gate pass at Bandelier (and all other designated areas in the country) until April 1, 1966. Daily entry tickets for Bandelier will be 25 cents per person (for all over age 16) and passes good for a week will be $1.25 per person.

NO ORDINARY THERMOMETER

LASL Scientists Develop Special Instruments for Eclipse

By EARL ZIMMERMAN



Taking the sun's temperature and otherwise checking on its state of being is a perennial astrophysical exercise, one that recurs in direct ratio to opportunity and the development of tools and techniques.

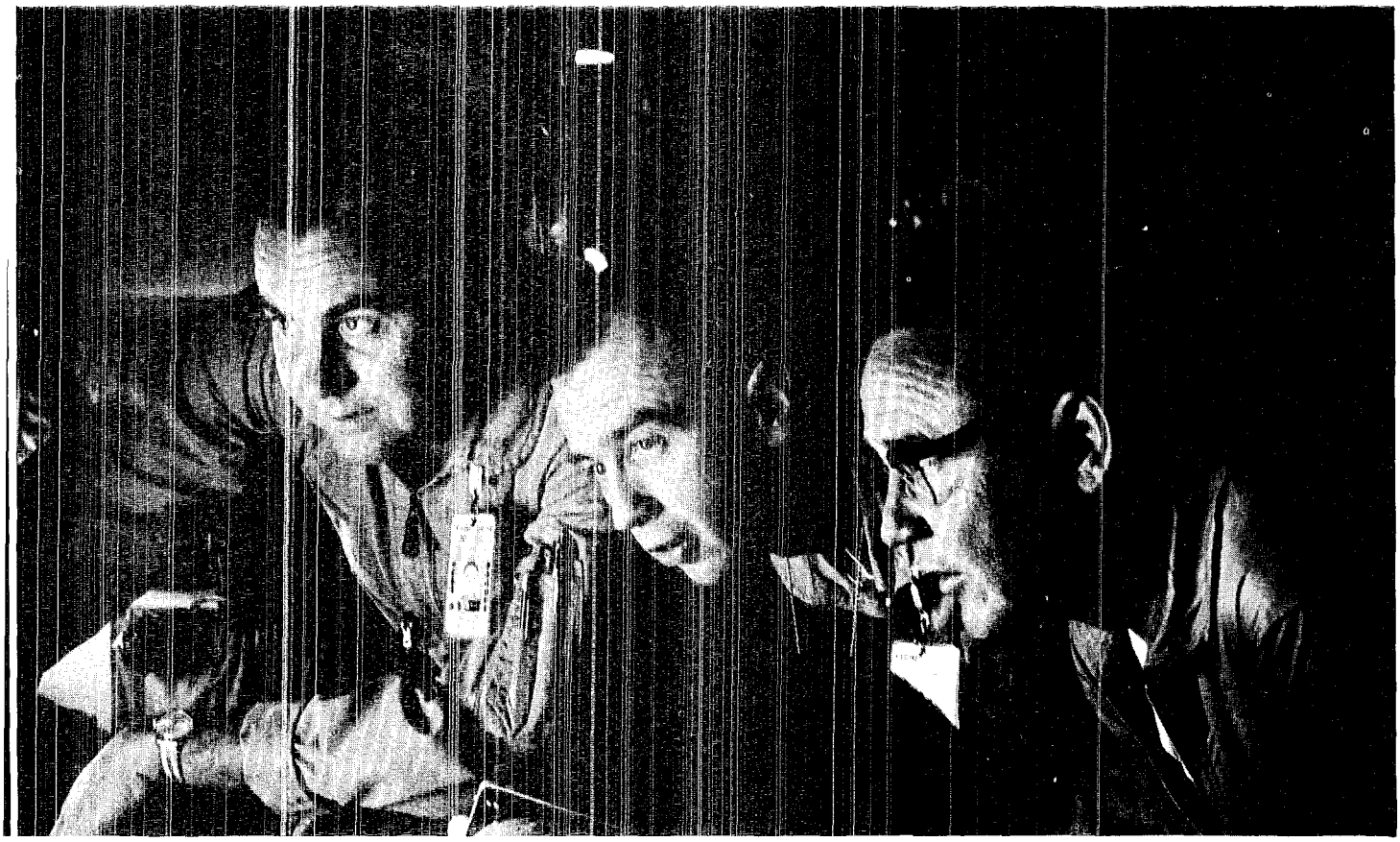
Instruments that will be used by Los Alamos eclipse observers this month represent the latest high point in that art and are almost certain to set the pattern for a good many observations yet to come.

Since dealing with temperatures that range in the millions of degrees precludes the use of an ordinary thermometer, scientists rely upon different instruments and a common physical phenomenon to obtain their temperature information: Matter in an agitated or abnormal state gives off radiation, of which heat is but one manifestation. Light, both visible and invisible, is another and by measuring this radiation it is possible to determine temperature.

The sun is composed of dozens of elements known on earth, so radiations given off by "hot" iron, or carbon, or oxygen, on earth can be used for comparison with radiations coming from the same elements burning in the sun. It should be understood, too, that the sun doesn't burn in the same sense that a piece of wood or paper burns. The solar fire is atomic in nature, actually a thermonuclear reaction which releases tremendous amounts of heat/energy.

Since one can't see inside the solar mass, where the atomic fire is actually burning, studies are made of its manifestations on the solar surface and in the corona, an envelope of extremely hot gases that surrounds the sun like a tight-fitting halo. Because of the scattering of sunlight by the particles of the earth's atmosphere, the corona cannot be seen in ordinary daylight; it has a brilliance only about a millionth as great as the sun itself.

Instruments used for solar radiation observations are called spectrometers—devices that "see" light and other radiations and sort them out according to their wavelength, or color. The wavelengths are extremely short and are measured with a term known as the Angstrom unit (after Anders Jonas Angstrom, a Nineteenth Century Swedish physicist). One Angstrom Unit, or Å, is equal to one ten-billionth (10^{-10}) of a meter. By applying these spectral measurements, or



These eclipse observers are no strangers to LASL's NC-135 jet plane—(from left) Walt Wolff of J-8, Art Cox of J-15 and Bill Ogle, Alternate J Division leader. They are scientific-crew regulars for the big plane's regular assignment.

wavelengths, to known standards it is possible to determine the energy, or "heat," of the radiation-emitting source.

It appears quite simple at first—why not aim your instruments at the sun and just read off the information? The first problem that arises is that the sun isn't a static ball of fire. Its surface convulses and wobbles, expands, contracts and rotates as part of its normal existence; its burning is not uniform; great thermal storms rage across the surface and in the various layers of activity that surround the main solar mass; there are strange and not-understood magnetic forces which exert a profound effect on the sun and even on the earth.

Solar physicists know that the corona is influenced very directly by the activities on the surface of the sun, but it is not clear what the connecting mechanism is.

Compounding those unsettled circumstances is the earth's own atmosphere, which literally swarms with observation-distorting mechanisms—dust, clouds, other radiations, and air itself.

Thus the task at once is difficult. That is why there are observatories on high mountain peaks, as close to the sun and as far from the earthly atmosphere as possible. It is also the reason that isolated sections of the sun are sought for observation, at periods when the sun is not especially active.

A total solar eclipse, at the quiet period of the sun's 11-year activity cycle, offers an ideal observation time. It is then when the so-called "solar flares" are infrequent, and the interactions between the solar surface and the corona can be studied with a minimum of disturbing influences.

Solar conditions will be "right" on May 30. This is a "quiet sun" year and the moon will pass in perfect alignment to blot out the solar disk for several minutes, creating a shadow that will streak some 7,000 miles across the South Pacific. There won't be another solar eclipse until November of 1966 and one of this duration occurs but rarely.

For the occasion, LASL scientists will have mounted, in the jet plane flying out of Samoa and on the Nike-Tomahawk rockets launched from Rarotonga Island, various types of cameras and spectrometers. They will be looking at both visible and invisible radiations, gathering

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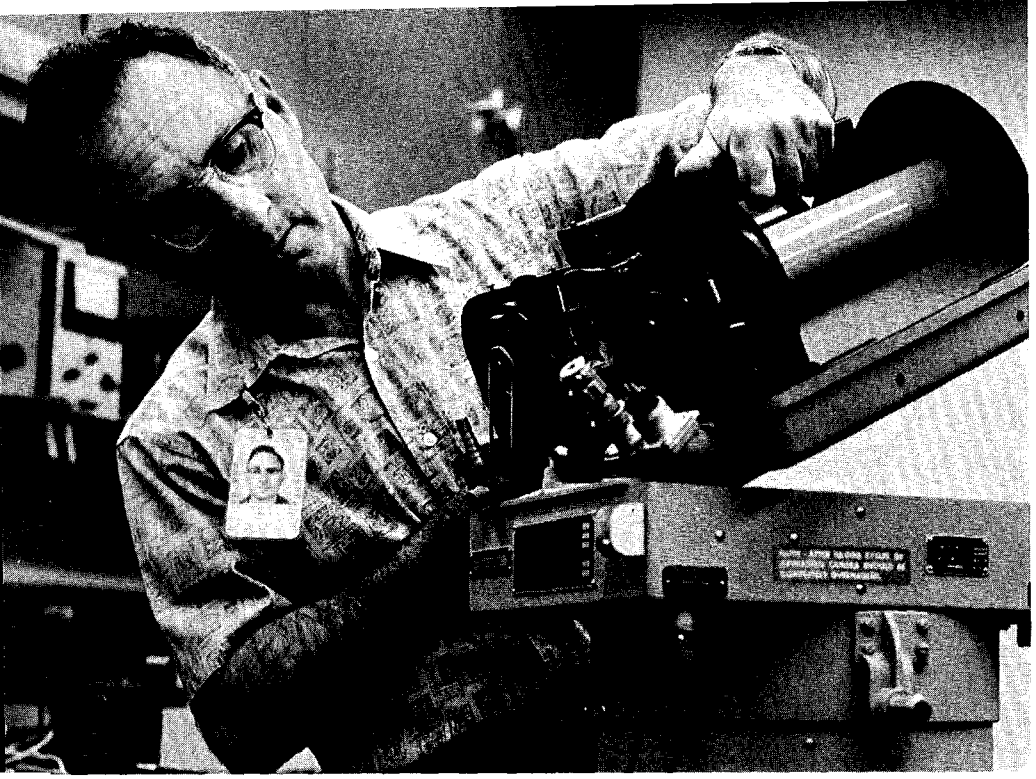


Sid Stone of J-10 attaches roll of film 9½ inches wide and 125 feet long to aerial camera that has been modified for eclipse photometry.

Ralph Partridge, J-DO, explains a point of operation in the tracking device he was instrumental in designing. It is one of several unique LASL innovations for May 30 eclipse.

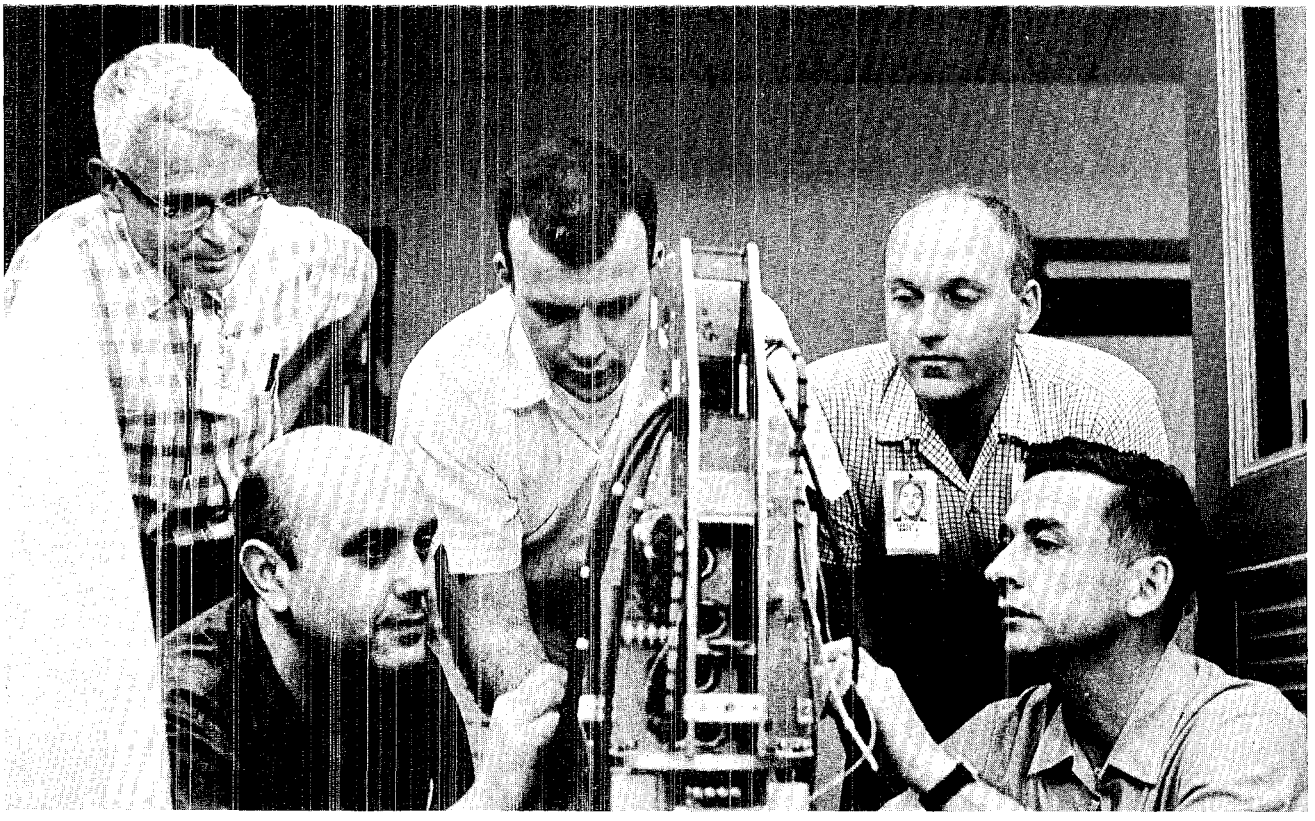
Thermometer . . .

continued from preceding page

data to determine not only coronal temperatures but the shape and density of the corona, and the influence of the great solar magnetic fields.

The rocket-borne experiments will concentrate on soft, or low-energy x-rays that come from the corona, in the 16 to 45 Å range, supposedly from atoms of carbon, nitrogen and oxygen that have been stripped of their electrons (ionized).

Eight detectors will be in each of the four instrument packages that will be launched. They will do their brief scanning from some 200 miles up and through tiny windows that have panes so thin they are measured by weight instead of thickness. These weigh 30 millionths of a gram per square centimeter and are covered with a vapor-deposited aluminum film of the same dimension. The opaque



Compact x ray sensing device, sans its nose cone cover, is checked out by P-4 team that will make rocket-borne eclipse studies from Rarotonga Island. Left to right are Harold Argo, Alternate P-4 Group Leader, and Sid Singer, Michael Montgomery, James Bergey and Doyle Evans, who is alternate member of the overseas group.

film permits passage of the x rays but keeps out visible light.

Also in each package is a pressurized metal bottle of gas needed for the radiation counters. A sensing device will trigger a regulator to assure that gas pressure remains constant even if some of the small windows are broken during launch or flight.

Rocket orientation with the sun will be stabilized with guidance controls developed by Sandia Corporation. The instrumentation will function properly so long as the guidance does not vary more than 2 degrees. Sandia personnel will do the rocket launching and operate the data telemetry.

Instruments on the plane will be "looking" at the visible light from ionized atoms and at the polarization of the light as it comes from the corona.

A very special type of spectrometer will be used for several of the experiments. Known as an interferometer, it is a sort of spectroscopic "fine tuner." In addition to achieving wavelength resolution better by a factor of 100 than the more conventional instrument, it is far more compact, occupying space measured in inches instead of feet.

Measurements of polarization—a condition in which light waves vibrate in a definite pattern—can be related to the magnetic fields in the corona, to the excitation of the coronal atoms, to space-traveling electrons and atoms that are known as the solar wind, and to interplanetary dust.

Preparation for the experiments has inspired the LASL development of many new instruments and major changes to other, more-standard equipment.

An example is a specially-built heliostat, an optical machine which compensates for apparent movement of the sun and supplies a steady beam of sunlight to a fixed point. The LASL heliostat, a combination of structural aluminum, mirrors, lenses and motors, is probably the first photo-electrically guided heliostat to be designed for use in an aircraft and during the eclipse will provide the steady solar image for five different experiments. The image will be formed by a 10-inch diameter 80-inch focal length telescope and will be fed to another LASL-built and equally unique instrument. This small device, named an R Theta Movement, can be quickly adjusted during the eclipse to permit observations of various points on the corona.

The use of fiber optics to "pipe"

continued on next page

Thermometer . . .

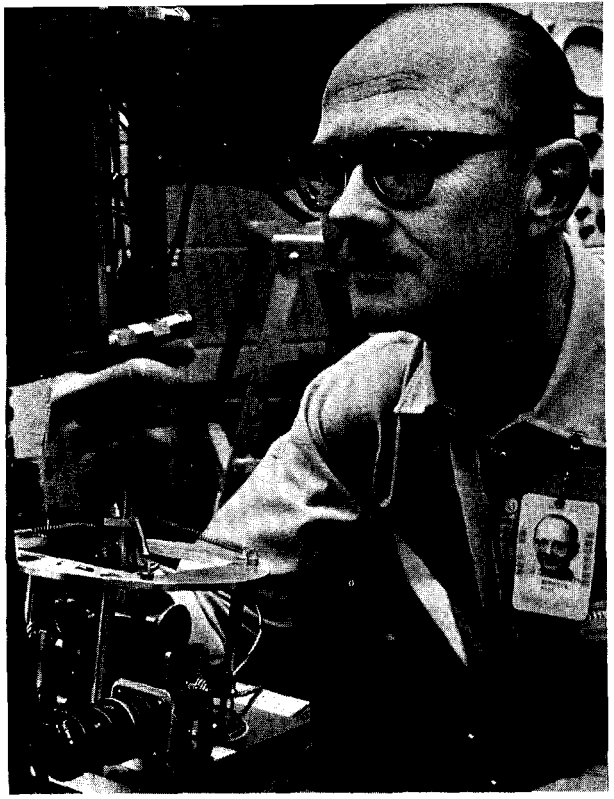
continued from preceding page

the solar light to the five experiments is another LASL first. The small wire-like light guides make it possible to literally carve the single heliostat image in pieces for multiple study.

Another example is a camera that was obtained from the Air Force to take pictures of the corona. The camera operates with a roll of film 9½ inches wide and 125 feet long. It will use a 42-inch focal length lens and will have a shutter mechanism designed and built at Los Alamos to accommodate a variety of exposure durations ranging from 1/100 of a second to 100 seconds. Attaining these exposures within the less-than-300 seconds of eclipse will be possible because of yet another Laboratory design innovation —an "intervalometer." This busy device is programmed to automatically change exposure time, trigger the film advance, supply correlating timing to a 16 mm monitor movie camera which will record tracking irregularities, flash data lights and reference marks on a small portion of each frame of exposed film and signal time pulses to tape recorders that will make a continuing record of the operation.

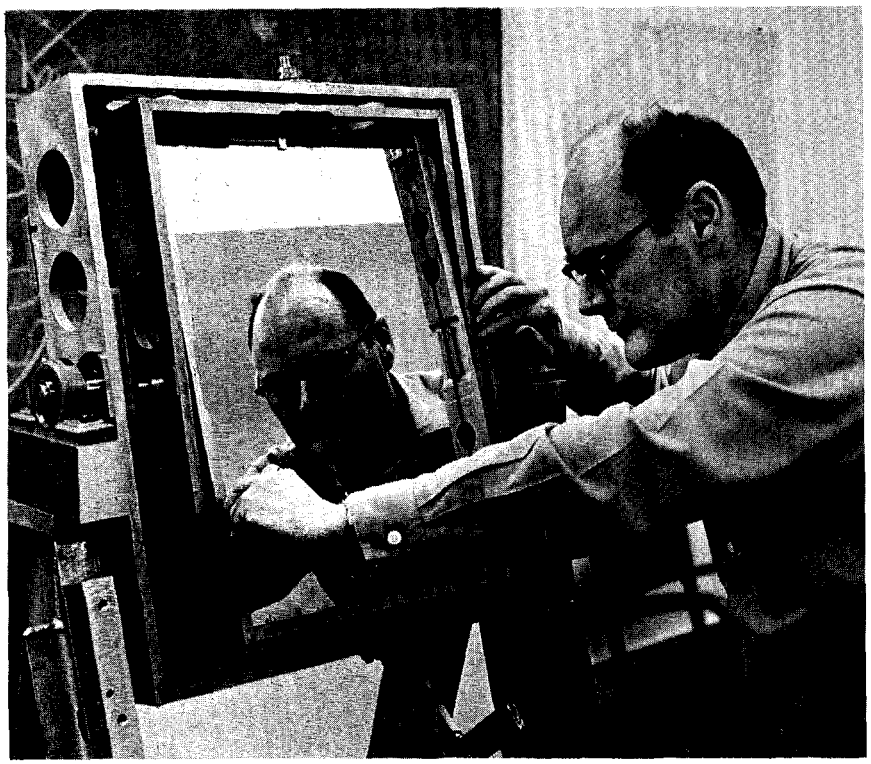
The camera, too, will be guided by a specially-built automatic tracker. Somewhat like an aircraft "automatic pilot," the trackers will depend on light-sensitive cells and exquisitely precise circuitry and gearing to keep the primary observation instruments on their solar target despite any pitch or roll of the plane.

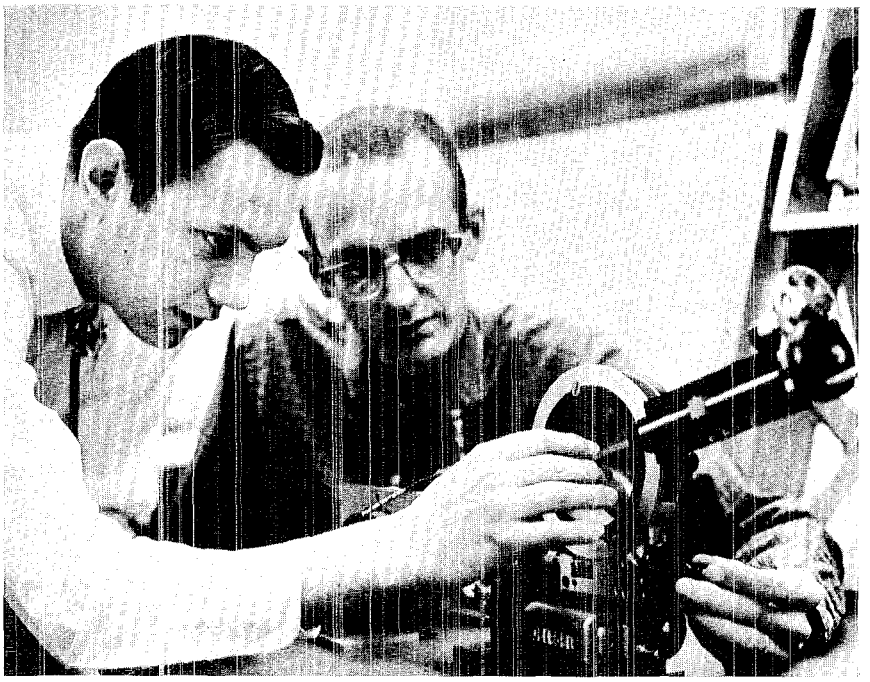
Although designed to perform automatically, the trackers are equipped with an override control for manual operation, just in case.



J-16 staff member Paul Rudnick makes a dry run on the manual override that is installed on instrument tracking and guidance device.

Universal mounting for his heliostat mirror is adjusted by Jim Hill of J-7. Mirror will reflect an image of eclipsed sun to a telescope that will focus it for five separate experiments.





Don Liebenberg (left) and Ken Williamson, Jr., CMF-9 cryogenists who double in solar physics, check out LASL-made instrument that will make it possible to quickly shift light guides for multiple observations during eclipse period. High-flying observation platforms will be far different from pair's eclipse expedition to northern Canada in 1963.

Eclipse Studies Are Special for 2 Who've Done it Before

When LASL's high-flying solar observatory makes its 4½-minute pass through the May 30 solar eclipse shadow over the South Seas none aboard will feel a greater sense of scientific accomplishment than Don Liebenberg and Ken Williamson, Jr.

The CMF-9 cryogenists will contrast these ideal experiment conditions with July 20, 1963, when they watched the last solar eclipse from remote Fort Providence in Canada's Northwest Territories.

There, 3,500 miles from Los Alamos, on their own time and at their own expense, and with their wives and children camping nearby, they aligned instruments borrowed from the Laboratory and hoped to get some measurements of coronal light.

But as the sky darkened for the 99 seconds of totality, high cirrus clouds scattered the light. The most notable accomplishment of the experiment was the stinging realization that northern Canada's teeming mosquito population attacks at dusk, regardless of the time of day.

Bitten but unbowed, they returned to more mundane low-temperature research at Los Alamos and began planning an excursion for the next eclipse, which would occur in the South Pacific region in 1965. They hoped, too, for some additional Laboratory sanction.

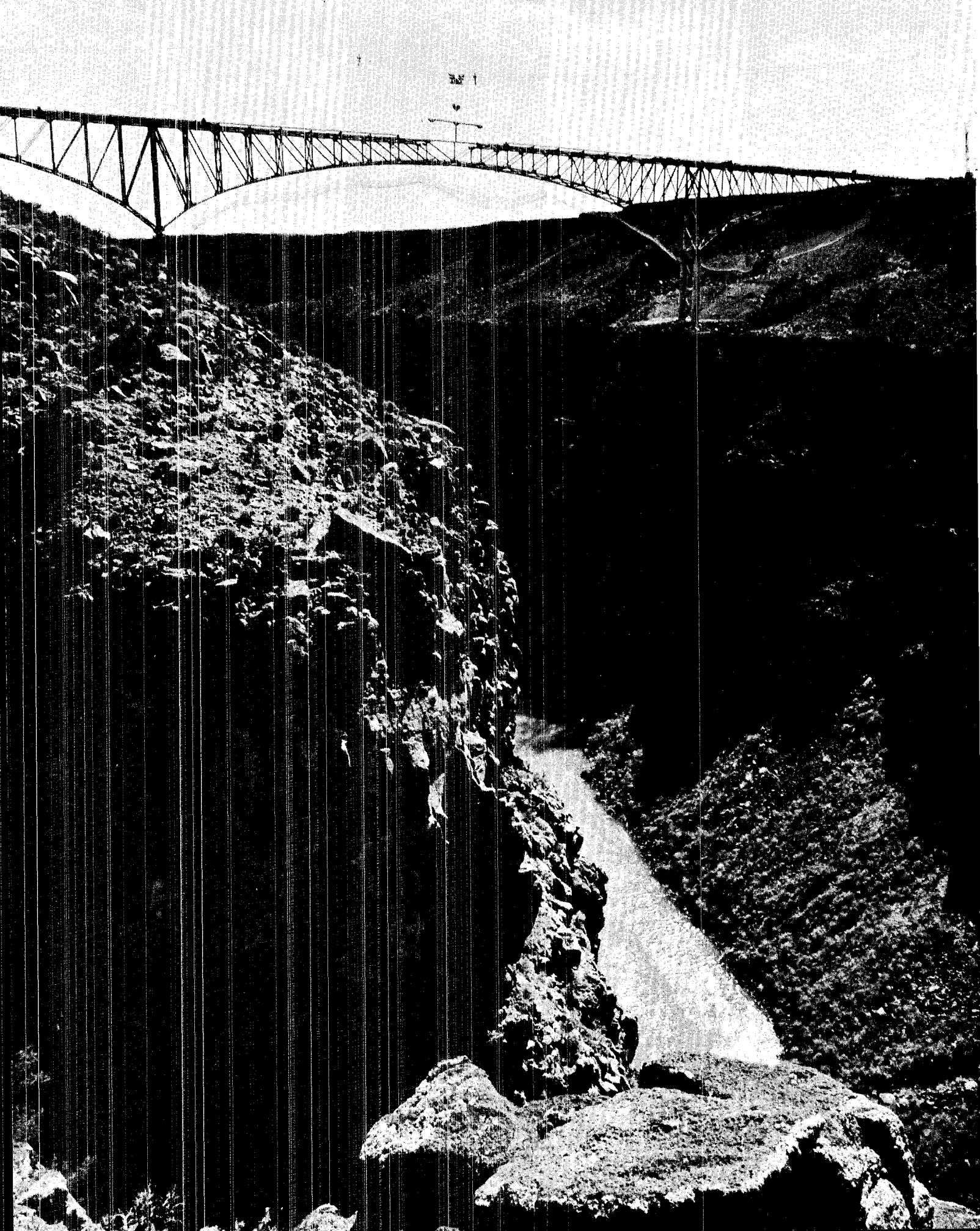
Astrophysics is not a new field of research at Los Alamos. It gains in importance, however, as major Laboratory research programs spill into space. Chief among these are Project Rover and radiation-in-space studies, the Vela detection program, and the fascinating links that fundamental research keeps indicating exist between elemental structure and the cosmos.

So it was not unusual that Liebenberg and Williamson found mounting enthusiasm in June 1964 when, with the encouragement of CMF-9 Group Leader Ed Hammel and CMF Division Leader Robert Fowler, they suggested the Laboratory might interest itself in a more thorough look at the 1965 eclipse. Astronomers Sid Stone, Ralph Partridge and Art Cox of J Division and Physicist Harold Argo of P Division quickly joined the espousal team.

A joint proposal submitted in August 1964 was approved by the Laboratory administration and detailed planning began—for one series of experiments to be conducted in an airplane and for another by Argo's P-4 space physicists using rockets to carry instruments into the shadow.

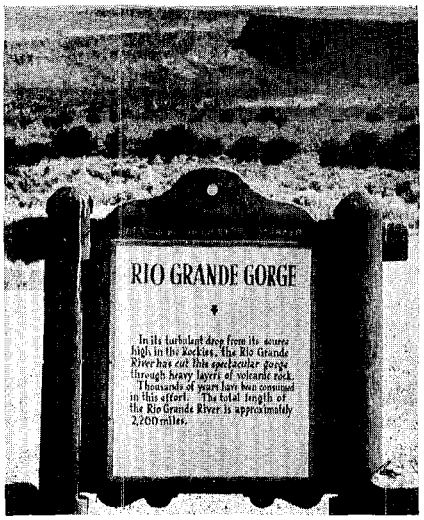
Now, unlike that crude do-it-yourself effort two years ago, Liebenberg and Williamson find themselves key members of a scientific expedition boasting a score of scientists, a multi-million dollar jet airplane, rockets, the State Department and the National Science Foundation as participants.

Unique in this month's eclipse studies is the use of high-altitude observation platforms—the highly instrumented NC-135 that LASL maintains as part of its readiness for atmospheric testing diagnosis, and the quartet of Nike-Tomahawk rockets that will be fired from Rarotonga Island. Similarities in the techniques of weapons diagnostics and cosmic observations make it possible to use the plane with relatively few modifications; LASL and Sandia Corporation have cooperated for several years in a continuing program of high altitude observations using rockets, so the eclipse expedition comes to P-4, also, as an almost made-to-order exercise.



WILD RIVER

Bill Assures Permanence Of Primitive Area



By PETER MYGATT

The "mighty Rio Grande" is a disappointment to many tourists seeing the river for the first time for it is more puny than mighty. But from the Colorado-New Mexico line south it has carved a black, deep, ragged gorge through the Taos Plateau.

To those few fishermen who have dropped over the edge of the canyon rim to the Rio some 600 to 800 feet directly below it comes as no surprise that the area may be designated a Wild River by the United States Congress; for this is a truly wild land.

The Rio Grande from the Colorado-New Mexico line south 60 miles to Pilar is one of six rivers proposed for immediate Wild River status in a bill draft cited as the "Wild Rivers Act" sent to Congress by Secretary of Interior Stewart L. Udall. The five other waterways named in the bill include the Salmon and Clearwater Rivers of Idaho, the Rogue of Oregon, Green River of Wyoming, and the entire Suwanee River of Georgia and Florida.

In recommending the area for Wild River status, it was noted that the 60 miles of Rio Grande in question and a four-mile segment of the Red River (included in the bill) are unique in several aspects: It is the only remaining natural area of consequence in the 1,900-mile length of the Rio Grande expected to retain its natural appearance; the gorge has its own independent water supply from springs and seeps—both hot and cold; and the area is mostly unmarred by man's activities, except for the lower five miles where a gravel road parallels the east bank of the river from Pilar to the Taos Junction bridge. Roads provide access to the area at only two other points: north of Taos where State Road 111 crosses the Rio Grande at the old Arroyo Hondo bridge, and at Red River where a road winds its way down to the state fish hatchery. A new, high-level bridge crosses the Rio Grande Gorge from rim to rim just south of the Hondo bridge, but the new structure does not provide access to the river some 600 feet below.

Other characteristics making the area unique are that the gorge is still in a wilderness state, both the Rio Grande and Red River box canyons (as the gorge is sometimes called) are nationally renowned among sportsmen for German brown and rainbow trout, and the aesthetic values of the area are outstanding. Vistas of the Rio Grande and its gorge are varied and frequent. The entire setting is one of volcanism, replete with lava flows and prominent remains of extinct volcanoes, all set against a backdrop of the Sangre de Cristo Mountains to the east.

Further, the area affords an opportunity for both active and passive recreation of exceedingly high quality not duplicated elsewhere,

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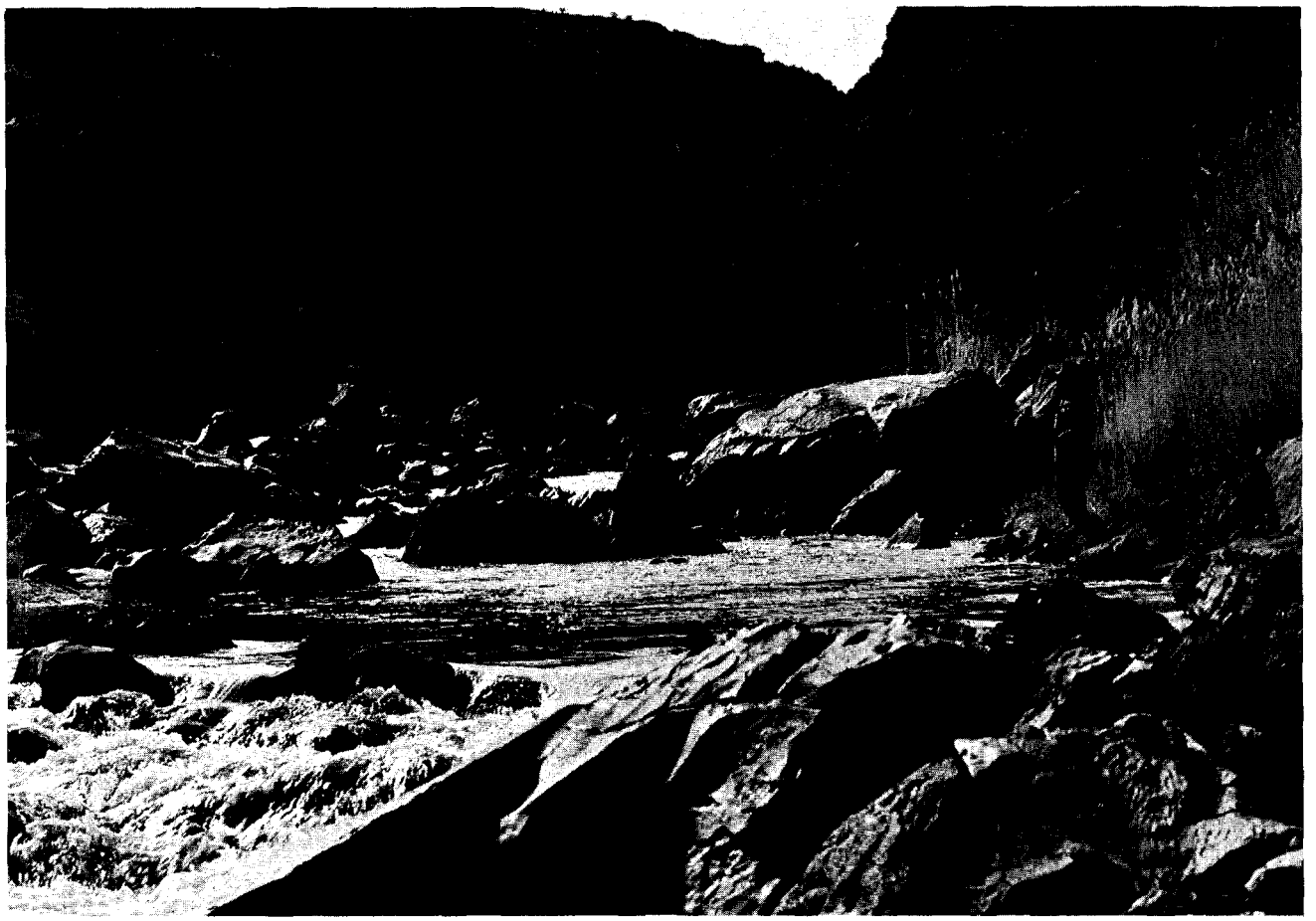
Soaring span of new Rio Grande Gorge bridge near Taos is 1,200 feet rim to rim and 650 feet above the shimmering Rio. Bridge will open in August. (Photo by Bill Jack Rodgers)



Trout fisherman is hard to spot on the bank of tumbling Rio as it drops through rocks and gorges. Rio's "box canyon" from Pilar north to Colorado line is a favorite for sportsmen seeking German brown and rainbow trout.

River . . .

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and it can sustain increased recreational use. The nearness to historical and cultural features of Taos, and the historical significance of "Rio Grande" give high national values to the area.

In recommending the Rio Grande, the Mid-continent Regional Wild Rivers Task Group said that 1) it preserves a unique and outstanding segment of a famous river, 2) it will stimulate local and state economies, 3) it will greatly enhance the Rio Grande's position as a key element in an existing recreation complex, and 4) it will add increased stature to an existing and proposed state recreation program.

The Wild Rivers idea came about when it was decided to do something about America's rivers which are considered an ever diminishing resource. Development of the nation's rivers is continuing at an ever increasing rate, and along with development comes pollution. The Task Group notes that once developed, these streams may lose forever the inherent values they now possess. The Group went on to say: "The need is urgent to identify and preserve a nationwide system of free-flowing streams and undeveloped rivers, or segments of rivers, for their recreation, fish and wildlife, scenic, scientific, historic, aesthetic, and symbolic values of the nation."

The Rio Grande trough was formed by a highly complex geologic process including uplift, faulting, and volcanic action. The dominant land form has resulted from a series of overlapping andesite-basalt lava flows which are relatively resistant to erosion. The Taos Plateau is covered with the remnants of extinct volcanoes—two of the most prominent being Ute Mountain, 10,120 feet, and Cerro de la Olla, 9,450 feet.

The Rio gorge is 1,300 feet from rim to rim and 200 feet deep at the Colorado-New Mexico line. At the confluence of the Rio Grande and the Red River 18 miles northwest of Taos the rim width is 4,000 feet and the depth 800 feet. At Arroyo Hondo, the width is 1,300 feet and depth 500 feet. Where the Rio Pueblo enters the Rio Grande, at the Taos Junction bridge, the width is 1,700 feet and depth 700 feet; while at Pilar the width is 6,600 feet and depth 600 feet.

During normal years of flow, the

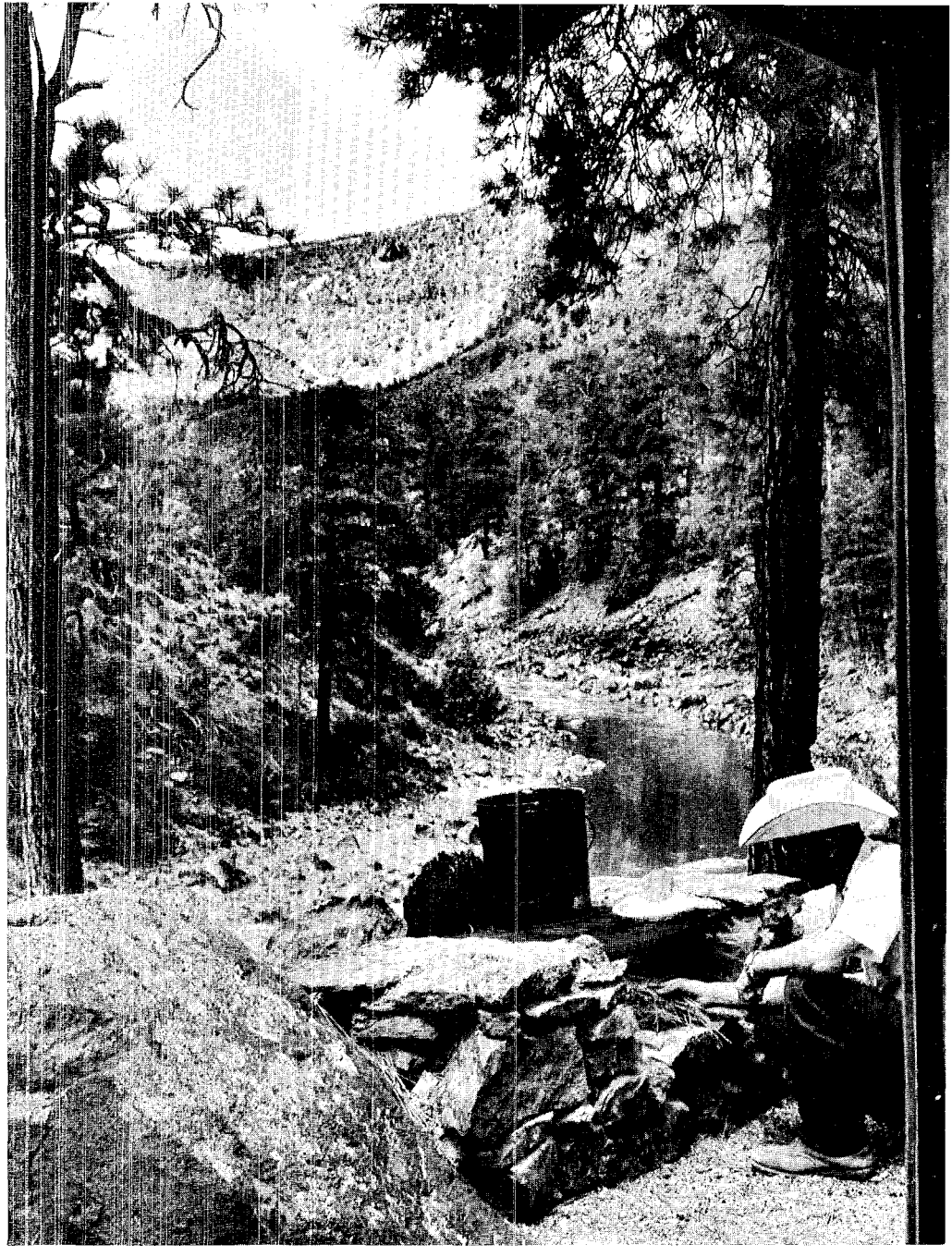
river itself ranges from 50 to 125 feet wide, though occasionally it is restricted to 15 feet by the gorge. In the 60-mile proposed Wild River area, the Rio Grande drops about 22 feet in every mile, while the total fall from the state line to Pilar is 1,600 feet.

In 1959 the recreation values of the gorge were given special recognition by the New Mexico legislature when the area was designated the "Rio Grande State Park." It may well be the largest state park in the United States. Appropriations to the Bureau of Land Management under the Accelerated Public Works Act of 1963 have been used to develop some recreation sites in the area, and in 1964 the New Mexico Park and Recreation Commission signed an agreement with the BLM to manage and maintain these sites, which include 48 picnic units consisting of shelters, fireplaces and tables. These units can be reached by driving five miles north of Questa on State Road 3, then five miles west on improved road to a location west of Cerro. The largest site, La Junta, is located where the Red River and Rio Grande meet. At this site, as well as the Chiflo site, there are trails to the bottom of the gorge where additional shelters are located.

Some plans being considered, should the Rio Grande box be designated a Wild River, include: Well designed trails, signs and structures both on the rim and in the gorge itself; an information center at the new high-level bridge; development of a recreation area at the confluence of the Red River and Rio Grande, including a headquarters building, information center, picnic and camping areas, and perhaps lodging facilities; and the state is considering another fish hatchery at an area known as Arsenic Springs.

Further, tree cutting would be prohibited, use of domestic livestock and hunting would be restricted, mining prohibited, Indian antiquities protected, and motorized travel except on existing roads would be prohibited.

The hydroelectric potential of this area of the Rio Grande would remain undeveloped under the Wild River plan. Actually a number of proposed dams in the gorge are no longer necessary or feasible since Cochiti Dam south of Los Alamos and Wagon Wheel Gap Dam near Creed, Colorado, will use the available water.



The Bureau of Land Management has developed a number of recreation sites along the Rio Grande, particularly near the Rio's confluence with the Red River.

Administration of the Rio Grande Wild River area is in question. The federal government--BLM and Forest Service--has title to 29.3 per cent of the area; Taos Pueblo, 9.3 per cent; New Mexico, 15.2 per cent; and private ownership, 46.2 per cent. Regardless of ownership, all agencies involved agree that the main task is to have the Rio Grande gorge designated a Wild River.

Phish and Fysicists

They don't bark or meow or bite the messenger, they demand little, eat even less and exist compactly and serenely and they don't argue nuclear theory.

Whatever the reason, the keeping and care of tropical fish is becoming commonplace in offices throughout the Laboratory.

LASL's aquaria range from purely commercial installations financed out of personal pocket or office coffee funds to ingenious lashups that utilize surplus, salvage or otherwise accumulated equipment.

At Pajarito Site, for example, a colorful colony of tropical fishes thrives in 95 gallons of water contained in a glass tank acquired some 15 years ago as a constant temperature bath for thermistor calibration. The experiments long since ended, the tank was discovered last year in a TA-18 storeroom, one of its ⅜-inch panes badly cracked. Some cement and a glass patch restored the tank's water-worthiness and it now is the center of attraction in the N-2 conference room, "aquascaped" with tuff and water plants, and home to nine varieties of fish.

"We have discovered," reported Physicist Tom Wimett, one of the lunch-hour custodians of the N-2 aquarium, "that a baby guppy has a half-life of about 3 seconds in that tank."

That's not unusual, because most tropical fish are notorious carnivores and will gluttonously consume their own young if given the opportunity. This leads to a cardinal rule of domestic fish-keeping:

Never have fish of a size that are smaller than the largest fish's mouth.

A piscine blessed event a few weeks ago was successful mainly because members of the Engineering section assigned to P-11 took prompt action to remove seven infant guppies from their mother. The separation was possible since that group's aquarium consists of two 5-gallon beakers scrounged from the dim recesses of the Physics Building basement. The second beaker presently is a guppy nursery.

H-1's Jerry Dummer and Jim Lawrence have three tanks—purchased commercially—in their office. Wags have affixed a "Department of Ichthyology" sign on the office door. The office almost made the Supply and Property records with that designation during an inventory not long ago.

The Dummer-Lawrence collection boasts one of the finest collections of fish in the Laboratory. The triad of tanks contains some 50 fish of a dozen species.

Rea Blossom of J-6 found caring for his son's tropical fish aquarium was wonderful therapy while he recovered from a serious illness. Now Blossom has

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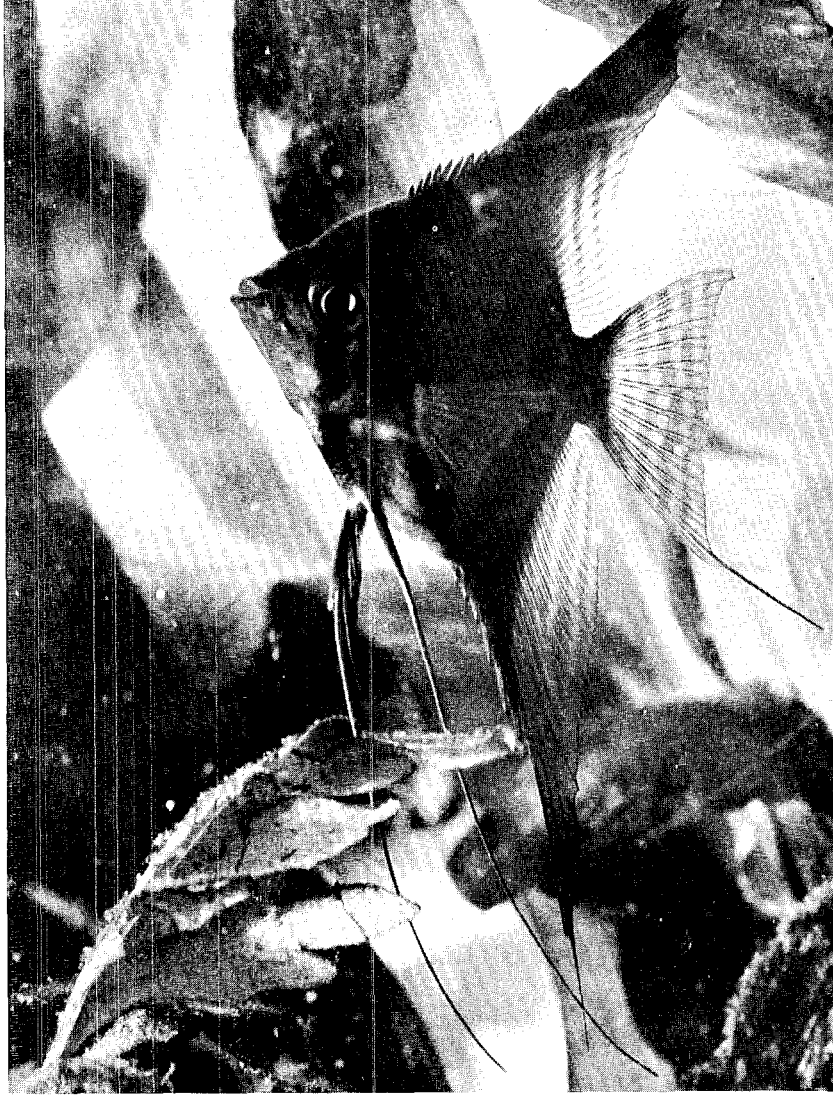
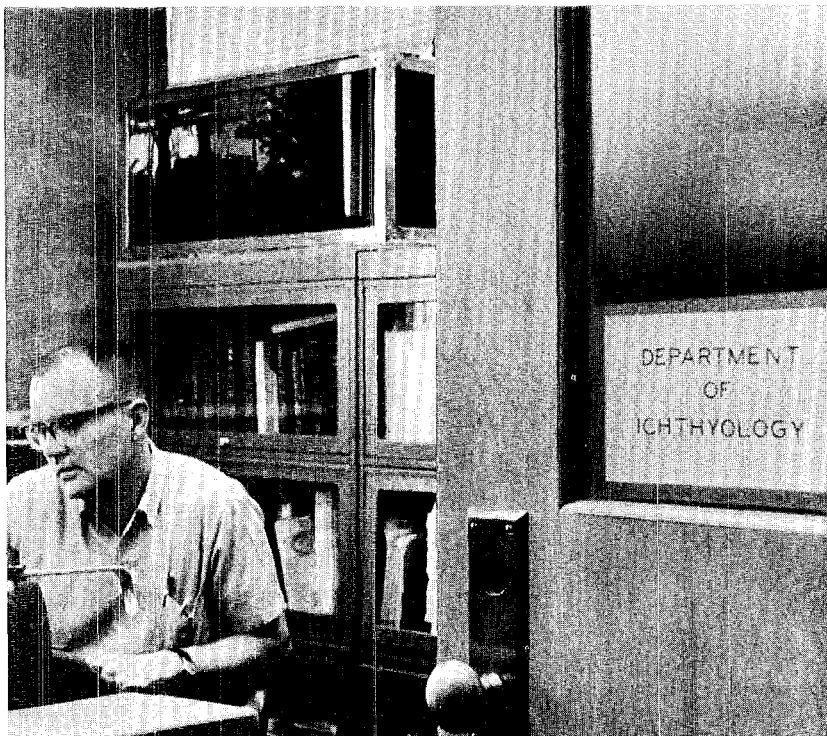
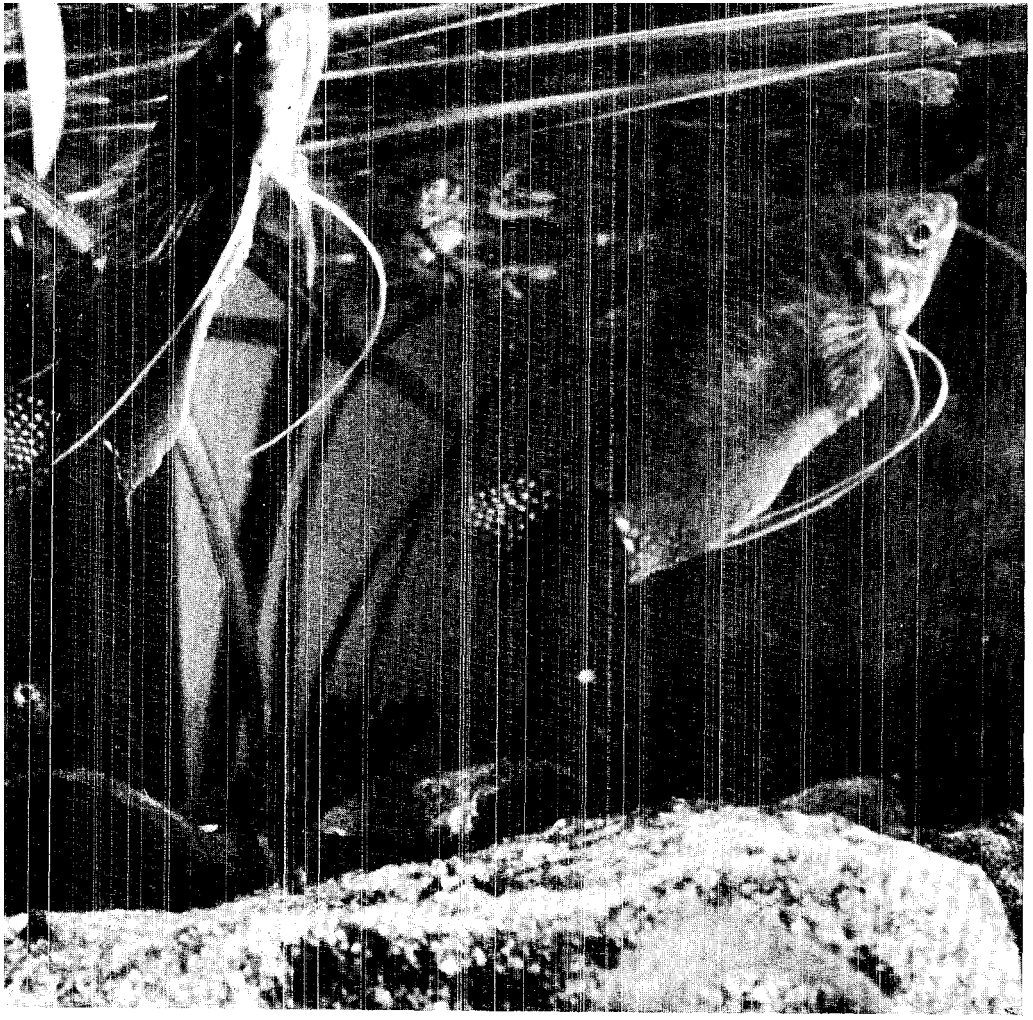
One of the most popular of tropical fishes is the angel fish. It comes from the Amazon and is black and silvery in color. Full grown angel fish are between 4 and 5 inches long.



Jerry Dummer of H-1 sits beneath one of three aquaria he and colleague Jim Lawrence have in their office. Sign on door has been taken seriously.





Left: Heading up to eat are two blue gourami, transplanted to Los Alamos from Malaya. This species, with the rather awesome scientific name, trichogasterus trichtopterus, gets along well with its neighbors.

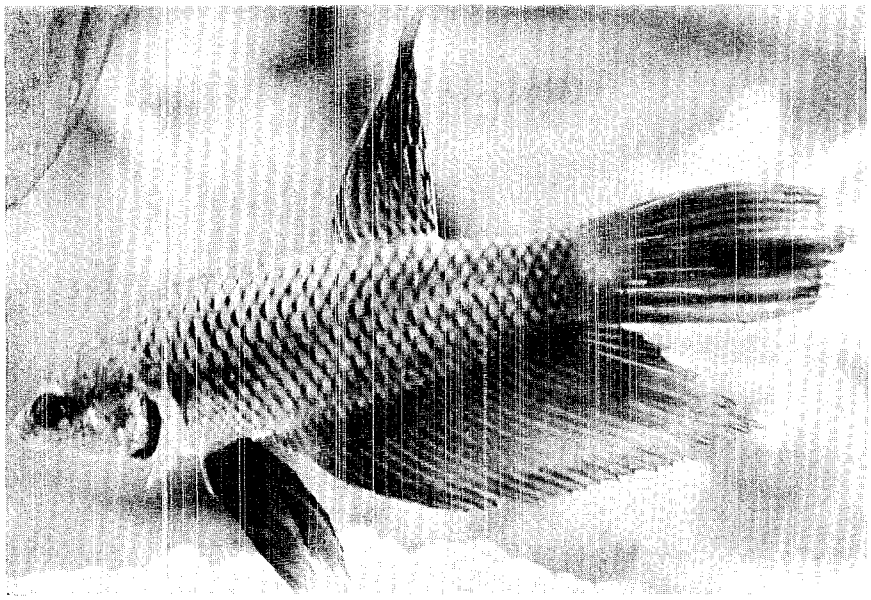
continued from page 12

a number of tanks at his home and another in his office.

George Rupert, who spends his workdays designing instrumentation for high-temperature refractory materials work in CMB-3, is probably the Hill's most enthusiastic fish fancier. Rupert has been raising fish for more than 30 years and operates a home business in that line. The Rupert home aquaria lineup numbers nearly 20 tanks, including one of 125-gallon capacity.

The diminutive fish in whom all the interest lies are native to tropical and semi-tropical fresh-water streams and are of diverse shapes and sizes and variegated coloring. Favorites are the guppy, the angel fish, the Siamese fighters and the neon and cardinal tetra. The latter species are striped with brilliant irridescent hues that seem to glow.

Although some varieties now are raised crop-like at "fish farms" in the United States, many others still are brought direct from remote streams in South America, Africa, India and Southeast Asia. One American importer makes weekly flights with his own transport plane to and from a collection point in Brazil.



Left: In their native land, the Siamese fighting fish are matched in public battles. Full grown at 2½ inches in length, this species comes in many colors, and when ready to fight turns red or blue.

A successful aquarium doesn't just happen, though. In addition to the previously-mentioned admonition on fish sizes it is important that the inhabitants of the tank be of species that believe in peaceful coexistence. There are some little fish that just can't stand other little fish, and they'll do each other in.

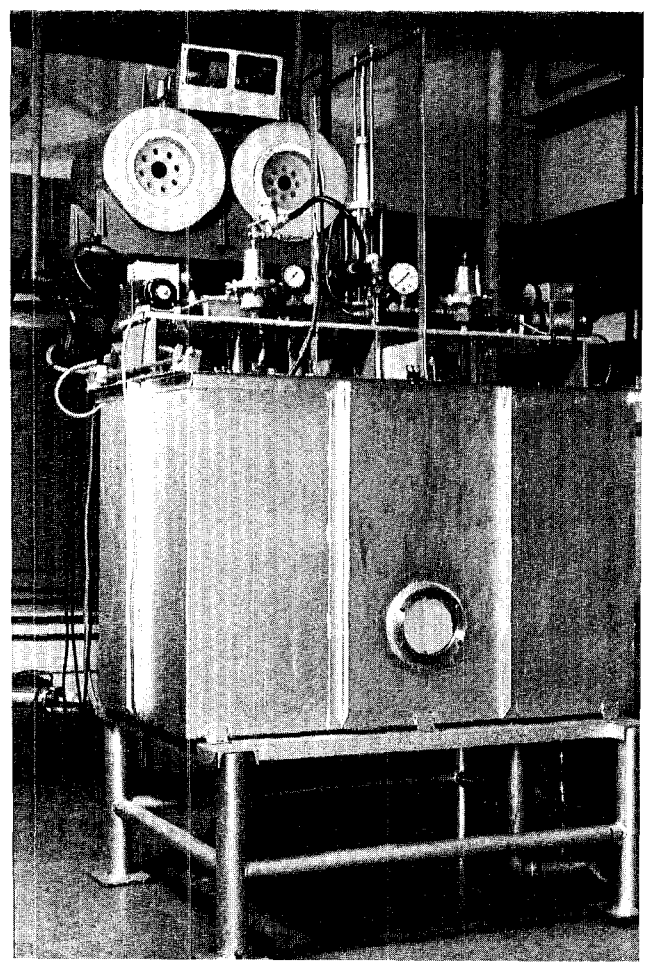
A few accessories are important, too, to make a tank a home, piscatorially speaking. An aerator, the little gadget that keeps the bubbles bubbling, supplies oxygen to the rather soggy aquarium atmosphere. Fish, like lunged land creatures, breathe oxygen and exhale carbon dioxide. Plants that thrive under water also aid in the production of oxygen and absorb carbon dioxide.

Aquarium tank covers keep dust and oil from forming on the surface and sealing out oxygen, they minimize evaporation and are handy mounts for the soft lights that add to the aesthetic value of the aquarium. They also help, but not always successfully in the Laboratory, to keep out meddlers and misguided do-gooders. Overfeeding has killed more fish than anything, and for some reason night employes are possessed of an urge to feed the fish as they make their nocturnal rounds.

Another accessory of value is a thermostat-heater, to maintain the 72-to-80 degree water temperature in which most tropical fish thrive.

In populating the tank, fish *aficionados* suggest adding a few snails, loaches, mussels or miniature catfish. These slow-moving fellows are docile and do a fine job as scavengers, consuming algae and performing other janitorial chores that lend a tidy atmosphere to the aquarium, which for most of its occupants, is the only world they will ever know.

Below: When is an aquarium not an aquarium? When it has radioactive "fish" and is called an Aquarium Machine, as was this early LASL critical assembly system. N-2 staffer Roger White recalls the big tank was used to study the nuclear behavior of oralloy systems submerged in water. Operations in this aquarium were carried out by remote control but visual observation was possible through the dense porthole in the side.



The Guadalupes

Spectacular Texas Neighbor of Carlsbad May Become National Park

By JOHN YOUNG

View of Guadalupe peaks from the plains of Texas. The southwestern escarpment rises a mile vertically from the desert floor and forms a magnificent and sharply contrasting cluster of the five highest peaks in Texas.

There are at least two things Texas does not have the most of in the nation, geographically speaking.

One is the highest mountains.

The other is national parks.

It may be several million years too late to raise up any more mountains, but the Federal government is doing something immediate about the Texas deficiency in national parks. Legislation to establish an entire new park in the Guadalupe Peaks area, right up against the New Mexico border just south of Carlsbad, is now in Congress. The proposal is part of the President's legislative program. It appears to have no opposition. It would be the second national park in Texas, a fitting companion for Big Bend, also in West Texas.

The Guadalupe Mountains contain all five of the highest peaks in Texas, clustered together at the crest of a remarkable geological formation. The formation is best known for another feature--one of the world's largest natural holes in the ground--at New Mexico's Carlsbad Caverns National Park, a few miles to the north of the high peaks, in the eastern foothills of the same range.

The range is the geologically famous Guadalupe Ridge, which starts up on the high plain southeast of Alamogordo and runs 40-odd miles down into Texas. The ridge contains what geologists say is the most extensive and significant fossil reef in the world. Known as the Capitan, the reef offers the best known view anywhere of an exposed formation laid down by organic deposits, primarily lime-secreting algae. The reef is roughly similar to barrier reefs in the Pacific Ocean which were similarly formed.

The entire reef is believed by speleologists to be honey-combed with caves, perhaps a continuation of Carlsbad Caverns, which were formed by the dissolving away of the limestone deposits by intrusions of ancient seas plus upheavals in the formation. Carlsbad and Guadalupe are part of the same package, geologically speaking. Many caves besides those at Carlsbad are known to exist in the Guadalupes but are unexplored, as are the farther reaches in Carlsbad Caverns themselves.

Rising at an elevation of 3650 feet 50 miles west of Carlsbad, the reef slants on up a long incline along the summit of the Guadalupes to their maximum elevation at 8,750 feet at Guadalupe Peak, highest point in Texas. Next to this point is El Capitan, like the prow of a great ship facing south, where the ridge ends abruptly in a 4,000-foot drop to the Texas plains. The 1000-foot sheer escarpment just below the summit of El Capitan is visible for 50 miles or more to the south. From the west side, accessible only by unmarked ranch roads, an escarpment that drops 5,000 feet in five miles presents an even more spectacular view, unmatched anywhere in the two states.

Although the range appears from below as a single ridge, it actually forms a long wedge with El Capitan at its point. Northward, it splits into two escarpments, the steep southeastern edge, facing the only access highway, being known as La Barrera del Guadalupe. The western side of the wedge contains the main Guadalupe ridge and a smaller parallel range, the Brokeoff Mountains, bounded by a huge fault, or rift. Between the two ridges forested highlands are carved with deep, narrow canyons. Some of the canyons have live streams, one of which is the habitat of the only native trout in Texas.

Rising as it does so abruptly from the Texas plains, the ridge provides a home for the plants and animals of at least four climatic zones in a space of a few miles, ranging from the associations of the Lower Sonoran Chihuahuan desert to the Canadian forest in the highlands.

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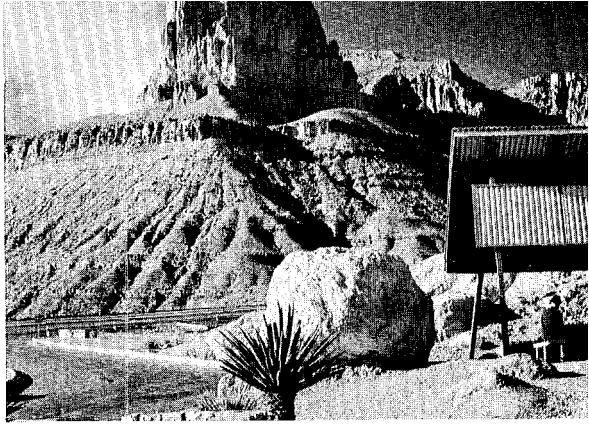
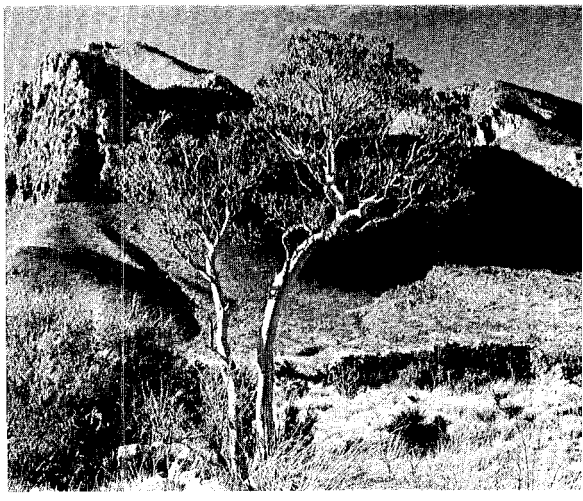


El Capitan, jumping-off place at the southern tip of the Guadalupe range in Texas, overlooks new and beautiful U.S. Highway 62-180 between El Paso and Carlsbad. In foreground is a new roadside park in Guadalupe Pass.



Ruins of the old Butterfield stage station at Pine Spring, almost invisible against the towering bulk of Guadalupe Peak, highest in Texas, its summit 8751 feet above sea level.

Looking south from Lincoln National Forest in New Mexico, the Guadalupe range's divided personality is apparent. Black Canyon runs down the center of this National Park Service aerial photo.

Guadalupes . . .

Continued from preceding page

Another feature that makes the region worthy of preservation as a park is the remarkable fact that since the early 1920's when the property came into the hands of the present owners, much of it has been deliberately maintained in a primitive state. Access has been strictly controlled, and there has been very little hunting over most of the area, none at all in magnificent McKittrick Canyon, one of the proposed park's show places. Elk and turkey, hunted out before the 1920's, have been reintroduced. A small remnant band of bighorn sheep is believed to be inhabiting the high peaks. There are also some black bear, a few cougars, a considerable mule deer population, and all the smaller animals common to this type of terrain.

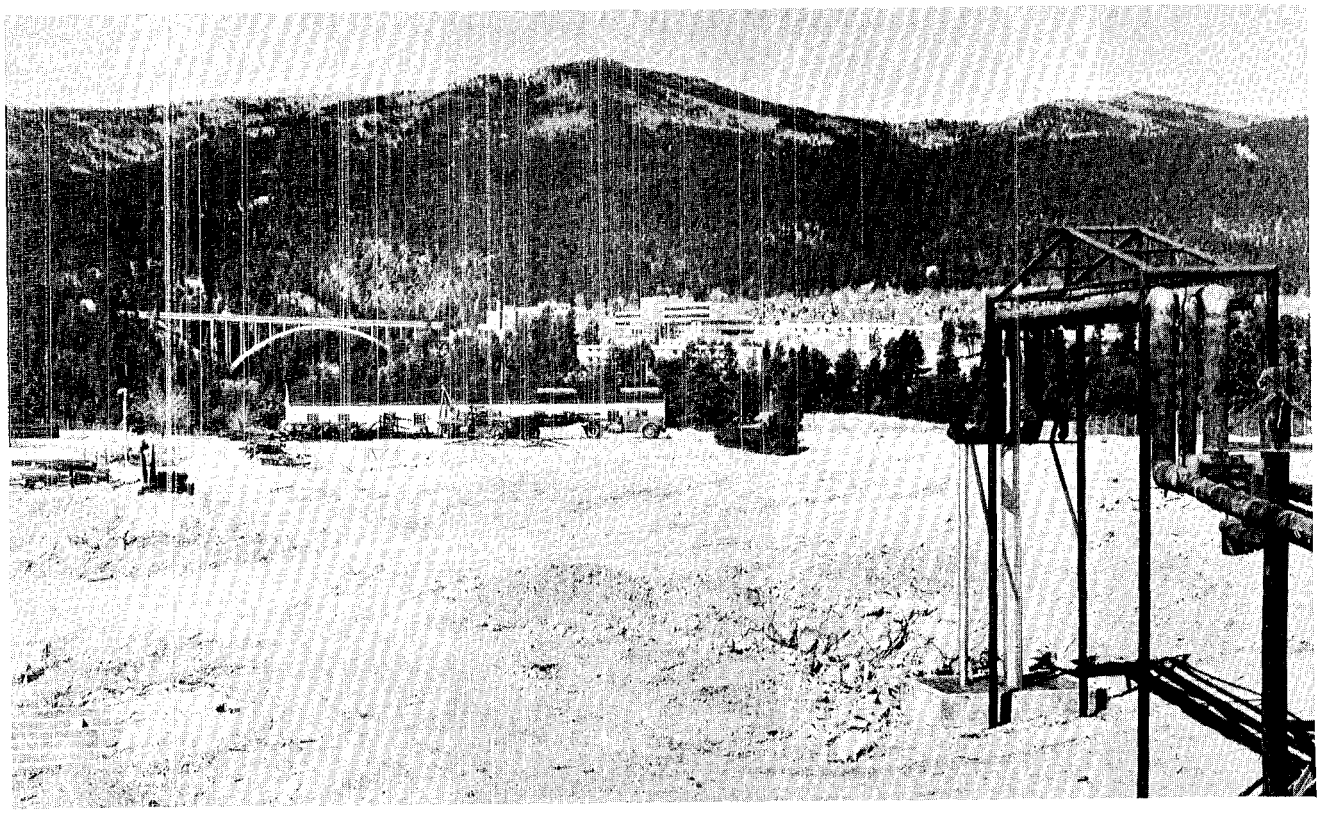
The spruce, aspen and pine forests of the high ridges are untouched. Angora goats, whose wool has provided one of the principal income sources for the ranch owners, have been fenced out of the more beautiful parts of the high country.

The proposed park has a nucleus to start from, the result of an outright gift of the lovely North McKittrick Canyon area in the northeast corner, closest to Carlsbad Caverns, where some 5,600 acres were donated to the Park Service by the owner, Wallace Pratt, in 1961. The remaining 71,790 acres in the proposed park is owned by J. C. Hunter, Jr., of Abilene, Texas, who has indicated his willingness to sell it to the government and has stated that he wants it to be preserved for public use.

Despite the fact that more than half a million people a year visit nearby Carlsbad Caverns, the Guadalupe Mountains have remained one of the least known mountain ranges in New Mexico or Texas. Much of the New Mexico portion of the range is national forest and has been popular with hunters, but it has no established campsites and few roads passable with ordinary automobile. At Sitting Bull Falls, on the east side, a concession-operated picnic park is adjacent to a spectacular waterfall over a cliff that in profile is said to resemble a sitting bull (not the Indian chief). Bad roads have limited visits to the picnic area, especially during wet weather, but the Forest Service plans to pave the road all the way in this spring. This is outside the proposed park, so far.

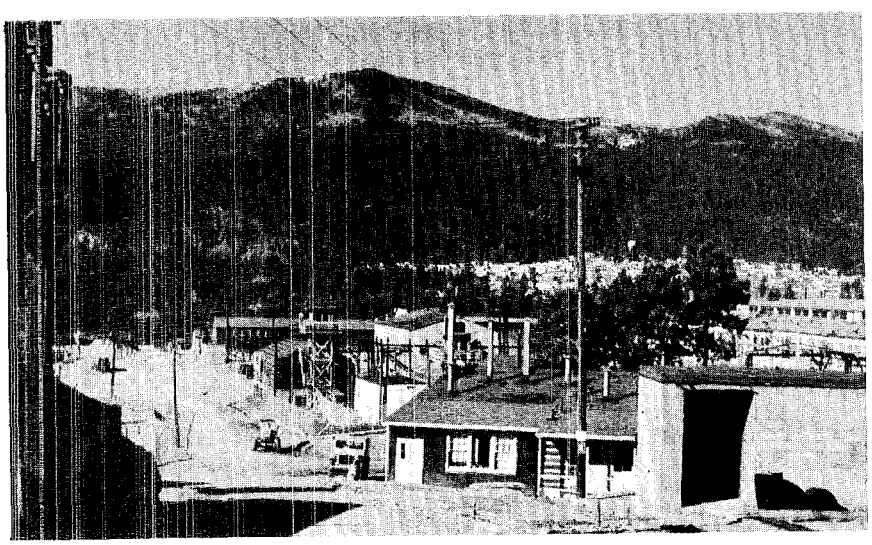
Entrance to the new park would be just south of the New Mexico line at the old Butterfield Stage station, The Pinery, now marked with a monument. A beautiful new highway winds through the edge of the mountains, directly under the massive headland of El Capitan, leading from Carlsbad Caverns over Guadalupe Pass to El Paso and points south. Long-range Park plans also call for a road down the summit of the ridge with access also from the New Mexico side, and camping sites in at least two areas in the high country.

Besides visiting Carlsbad Caverns, as nearly everyone in Los Alamos has at one time or another, a few Los Alamos people have seen some of the proposed new park, either on their own or as members of a Sierra Club expedition into McKittrick Canyon last year. It is just a little over 300 miles from here, not much more than a half-day's drive.



NOW and THEN

THE OLD TECH AREA (TA-1), where the bomb was born and nearly all the work of the Laboratory was centered before the South Mesa development, is nearly bare now, its buildings razed and the ground being cleared for possible commercial or residential development. Below is a photo taken in 1948, shortly after the Western Area housing was built but before Los Alamos Canyon was spanned with a bridge. Above is the scene in April 1965. Even the Jemez Mountain snow patches are the same.



Dr. Mary Bunting, the first woman member of the Atomic Energy Commission, was a recent Laboratory visitor. Dr. Bunting, who is on leave as President of Radcliffe College, is a bacteriologist and was especially interested in the work of the LASL Health Division. In the photo she is with H-4 Group Leader Wright Langham during a tour of HRL Building. After leaving Los Alamos, Dr. Bunting traveled to Poland for a tour of nuclear research facilities there.

NEW HIRES

Homer Thomas Boyles, Fairview, N.M., GMX-3 (Short Term—Rehire)

Landis Lee Marriott, Los Alamos, K-2

Hurshel M. Ainsworth, Vallejo, Calif., K-4

Marjorie Flo Butler, Los Alamos, J-DO (Part Time)

Wilfred R. Romero, Santa Fe, N.M., SP-3 (Short Term)

John W. Shelby, Los Angeles, Calif., SP-LA

Bruce Stewart, Lynn, Mass., J-10

Connie C. Archuleta, Espanola, N.M., K-4

William D. Barney, Santa Fe, N.M., K-4

Rebecca R. Campos, Espanola, N.M., W-1

Barbara Joyce Lujan, Los Alamos, M & R

John D. Harrison, Los Alamos, SP-3

Bernard P. Verhoeven, Monroe, Mich., K-1

Ruth E. Peterson, Los Alamos, K-1

Minerva E. Lory, Los Alamos, K-DO

Judith Ann Lory, Los Alamos, SP-1

Edward Max Hidalgo, J-10 (Casual —Rehire)

Thomas Ralph Velarde, Espanola, N.M., D-8

'Bilk-Mooson Cross Means Trouble in Valle Grande'

Each spring, coincidentally with April 1 publication, The Atom and its predecessor, The LASL News, has presented a story with a rather uncommon news value.

Previous "scoops" have included the great neutrino bomb announcement of Ralph Cooper, the discovery of petrified post holes at White Rock, the startling revelation of plans for an underground laboratory in the Jemez Mountains, and the exclusive coverage of the Ashley Pond regatta.

This year's April news break was an illustrated report on the amazing discovery of a herd of bilk in the Valle Grande and speculation on how the rare crossbreed of bison and elk came to be foraging there. It was with pleasure, then, that the Atom news staff received a communication from Mr. Ted Sherwin, Albuquerque amateur zoologist and historical prognosticator, in which he adds fascinating information and speculation to the bilk account.

One of the animals shown in the photographs, Mr. Sherwin contends, is not a bilk but a mooson, a moose-bison cross. The photo, he said, displayed the characteristic short-coupled body and high shoulders reminiscent of "Old High Pockets," the original herd sire first sighted in the Jackson Hole country near Yellowstone Park many years ago.

Mr. Sherwin continued with a rather startling prediction:

> "I'm pretty sure that the reason these two hybrids have been seen together is that the Indians are preparing to regain their hunting grounds in the Valle Grande in an ambitious variation of their own anti-poverty campaign. These two breeds are going to be allowed to intermix, crossbreed and multiply in that area, while the Texans continue to spend vast sums of money developing the great crater for a private club.
>
> "But at just the right time, the Indians will round up all these giant crossbred animals and stampede them along the exit road, just as the Texans are leaving for the season.
>
> "And some will probably say that a just fate has befallen the flatlanders when they are "milked" by the Indians."

WHAT'S DOING

OUTDOOR ASSOCIATION: No charge; open to the public. Contact leader for information on specific hikes.

Thursday, May 6, evening hike. Dibbon Hagar, leader.

Sunday, May 9, Tsiping Ruin, an Indian ruin above Canones. Ken Ewing, leader.

Thursday, May 13, evening hike. Virginia Winsor, leader.

Thursday, May 20, evening hike. Ken Ewing, leader.

Sunday, May 23, Peralta Canyon, starting at State Route 4 and ending near Jim Young's ranch. Terry Gibbs, leader.

Tuesday, May 25, evening hike. Barbara Skaggs, leader.

Thursday, June 3, evening hike. Marlene Cockle, leader.

LITTLE THEATRE: "The White Sheep of the Family," by L. du Garde Peach and Ian Hay. Family entertainment farce regarded as the "inspiration" for the television series "The Rogues." Tickets $1.75 adults, 75 cents students, or by season ticket. Produced by Los Alamos Little Theater.

Friday and Saturday, May 14 and 15, 8:15 p.m. Civic Auditorium.

FILM SOCIETY: Civic Auditorium. Film shown 7 and 9:30 p.m. Admission by season ticket or 90 cents single admission.

Wednesday, May 19, "Henry V," Sir Laurence Olivier's 1944 production of Shakespeare's classic. 134 minutes.

CUB SCOUT CARNIVAL: Recreation Hall, May 7, 6-10 p.m., and May 8, 2-10 p.m. Pinewood Derby 2 p.m. May 8. No door charge, activity tickets 50 cents, available through Cub Packs and Dens and at door.

SOAP BOX DERBY CLINICS: YMCA Building, 10 a.m., May 1, 15 and 29 and June 12, 19 and 26. For boys and parents in preparation for July 10 races.

SWIMMERS CLUB OF LOS ALAMOS: Swims every Sunday, 7 to 9 p.m., high school pool. Membership open to all interested adults.

LOS ALAMOS HIGH SCHOOL POOL: Schedule for public swimming. Adults 35 cents, students 15 cents.

Saturday	1 p.m. to 5 p.m.
Sunday	1 p.m. to 5 p.m.
Monday	7 p.m. to 9 p.m.
Tuesday	7 p.m. to 9 p.m.

SWIMMING CLASSES: sponsored by Red Cross for members of the Calorie Counters and all pre-natal and post-natal women. Free. Meets every Saturday, noon to 1 p.m., High School pool. Phone 2-4094 for further information.

The Technical Side

American Chemical Society Meeting, Detroit, Mich., April 4-9:

"Preparation of US, USe, UTe, UP and UAs by the Bomb Method" by Marvin C. Tinkle and John A. O'Rourke, both CMB-8.

"Preparation and Crystal Structures of Some Pentavalent Actinyl Compounds" by Thomas K. Keenan and F. H. Kruse, both CMF-4.

"Fluoride Stabilization of Actinide Elements in High Valence States" by R. A. Penneman, L. B. Asprey, and F. H. Kruse, all CMF-4.

"The Mossbauer Effect of I^{129} and a Calculation of the Outer s and p Populations in the Alkali Halides" by D. W. Hafemeister, Post-Doctoral in P-2; H. deWaard, W. H. Flygare and G. DePasquali, all of University of Illinois.

"The Vibrational State of Hydroxyl Radicals Produced by Flash Photolysis of 0-18 Water Vapor-Ozone Mixtures" by Rolf Engleman, Jr., GMX-2.

"The Kinetics of the Reaction Between Thallium(III) and Vanadium-(III)" by N. A. Daugherty, CMF-2.

"Forced Convection Heat Transfer to Cryogenic Hydrogen" by Kenneth D. Williamson, Jr., and John R. Bartlit, both CMF-9.

"Large Scale Cryogenics in the Nuclear Rocket Program" by A. F. Schuch and F. J. Edeskuty, both CMF-9.

Symposium on Reactor Kinetics and Control, University of Arizona, April 5-7:

"Optimal Nuclear Rocket Engine Control" by R. R. Mohler, N-4.

"The Ultra High Temperature Reactor Experiment" by Howard B. Demuth, Frederick P. Schilling and Larry Weintraub, all K-4.

Conference on Phenomena in the Neighborhood of Critical Points, National Bureau of Standards, Washington, D.C., April 5-8:

"The Coexistence Curve of He^3" by Robert H. Sherman, CMF-9.

Nuclear Medical Operations Workshop, DASA, Sandia Base, N.M., April 5-9, (CLASSIFIED MEETING):

"Nuclear Accidents" by Thomas L. Shipman, M.D., H-DO.

Seminar at California Institute of Technology, Pasadena, April 9:

"Neutron Physics Experiments with Nuclear Detonations" by Philip A. Seeger, W-8.

Third Annual American Nuclear Society Student Conference, Wright-Patterson Air Force Base, Dayton, Ohio, April 9-10:

"Approximate Solutions to the Nonlinear Reactor Kinetics Equations Using Taylor Series Expansions" by John C. Vigil, K-1.

Meeting of Los Alamos Subsection of IEEE, March 25:

"The Development of PHERMEX" by Frederick R. Tesche, GMX-11

Graduate Students Seminar, Washington University, St. Louis, Mo., March 31:

"Particle Size of Aerosols: Significance and Determination" by H. F. Schulte, H-4.

New Mexico Society for Biological and Medical Research Meeting, Santa Fe, N.M., April 3:

"The Surface of Animal Cells, Sialic Acid, and Other Irrelevancies" by Paul M. Kraemer, H-4.

"Selective Heat Inactivation of Genetic Markers on Bacteriophage Lambda DNA" by Benjamin J. Barnhart, H-4.

"Quantity Production of Synchronized Mammalian Cells" by D. F. Petersen and E. C. Anderson, both H-4.

"Timing of Synthesis of m-RNA and Protein Essential for Cell Division" by R. A. Tobey, D. F. Petersen, and E. C. Anderson, all H-4.

Symposium on Fission Product Release and Transport Under Accident Conditions, Oak Ridge, Tenn., April 5-7:

"The Character of the Effluent Material from a Destruct of a Nuclear Rocket Engine" by Richard W. Henderson, H-8.

"Airborne Radioactivity and Contamination Patterns from the Destructive Test of a Nuclear Rocket Engine" by Harry S. Jordan and Robert V. Fultyn, both H-8.

Consultation with University of Arizona, Astronomy Dept., April 12-16:

"LASL Lens Design Program for the IBM 7090" by Charles A. Lehman, Sr., T-5.

Nineteenth Meeting of the AEC Metallography Group, Oak Ridge National Lab., April 20-22:

"Examination of Rover-Type Fuel Element Components by Electron Microscopy" by Thomas G. Gregory, GMX-1.

American Geophysical Union Annual Meeting, Washington, D.C., April 19-22:

"Characteristics of the Particle Activity Near the Dawn Boundary of the Magnetosphere" by S. J. Bame, J. R. Asbridge, H. E. Felthauser, R. A. Olson, and I. B. Strong, all P-4.

"Streaming of Electrons and Protons in the Earth's Magnetospheric Tail at 17 Earth Radii" by J. R. Asbridge, S. J. Bame, H. E. Felthauser, R. A. Olson, and I. B. Strong, all P-4.

"Solar Wind Directional Distributions in Interplanetary Space and the Transition Region" by I. B. Strong, J. R. Asbridge, S. J. Bame, H. E. Felthauser, and R. A. Olson, all P-4.

IEEE Region Six Conference, Las Vegas, Nev., April 13-15:

"Survey of Kiwi Control Systems" by John P. Rink, J-17 (NRDS) and Murlin J. Nutter, J-18.

"Diagnostic Instrumentation Transducers for Kiwi Reactors" by E. A. Brown, N-4.

Sixth Symposium on Engineering Aspects of Magnetohydrodynamics, University of Pittsburgh, April 21-23:

"Integration Problems of Gas-Cooled Nuclear Reactors and M.H.D. Generators" by Ralph S. Cooper, T-DO and Curtis A. Rhodes, N-7.

"Prospects for a 1000 Mw(e) Nuclear Reactors/MHD Power Plant" by Lawrence A. Booth, K-4.

Joint NASA-AEC Liquid Metals Corrosion Meeting, Gatlinburg, Tenn., April 21-23:

"The Oxidation of Refractory Metals in Liquid Sodium" by James M. Williams, K-2.

"Mass Transfer of Ta in Molten Pu-Co-Ce Fuels—The Linear Diffusion Experiment" by J. C. Biery and C. R. Cushing, both K-2.

American Physical Society Meeting, Washington, D.C., April 26-29:

"Polarization Measurements in Proton-Nucleus Elastic Scattering and the Nucleon-Nucleus Potential Derived Therefrom" by L. Rosen, P-DO, J. G. Beery, P-10; and A. S. Goldhaber and E. H. Auerbach, both Consultants.

"Isobaric Analog States in Cu^{59} and Cu^{61}" by D. D. Armstrong, and A. G. Blair, both P-12.

"$Co^{59}(He^3md)Ni^{60}$ Reaction" by A. G. Blair, P-12 and E. R. Flynn, P-10.

"Linac Error Analysis by Matrix Method" by Harold S. Butler, P-11.

"Numerical Drift Tube Shape Studies" by Harry C. Hoyt, T-5.

"Gravitational Flow of Liquid He II through Narrow Channels" by William E. Keller and Edward F. Hammel, both CMF-9.

"He^3 Inelastic Scattering from $Fe^{56, 58}$ and Ni^{58}" by E. R. Flynn, P-10.

"High Efficiency Solid State Telescope for 20-MeV Neutrons" by H. C. Bryant, P-DO and E. R. Flynn, P-10.

Forty-Ninth Annual Meeting of the Federation of American Societies for Experimental Biology, Atlantic City, N.J., April 9-14:

"RNA Synthesis in Synchronously Dividing Chinese Hamster Ovary Cells" by A. G. Saponara, M. D. Enger, and W. H. Langham, all H-4.

"Timing of Synthesis of m-RNA and Protein Essential for Cell Division" by R. A. Tobey, D. F. Petersen, and E. C. Anderson, all H-4.

"The Energy Metabolism of Synchronously - Dividing Mammalian Cells" by William D. Currie and Charles T. Gregg, both H-4.

"Cellular Biochemistry and Physiology of Cold- and Heat-Exposed Squirrel Monkeys (Saimiri sciuren)" by R. R. J. Chaffee, H-4; H. R. Allen, M. Brewer, S. M. Horvarth, C. Mason, and R. E. Smith, all University of California at various campuses.

"Observation of the Mossbauer Effect in the 6.2 keV Gamma ray of Ta^{181}" by R. D. Taylor and W. A. Steyert, both CMF-9; E. K. Storms, CMB-3, and T. A. Kitchens, P-11.

"Some Reactions of the Excited States of Helium" by B. E. Watt and J. A. Jackson, both P-DOR.

"E x B Heating of a Plasma" by L. C. Burkhardt, H. J. Karr,and J. N. DiMarco, all P-14.

"Fluctuation Damping at E* 16 to 17 MeV in (a, p) Reactions" by R. B. Leachman, G. Dearnaley, W. R. Gibbs, and G. G. Seaman, all P-12.

"Fluctuations in the Na^{23} (a, p) Mg^{26} Cross Section" by G. G. Seaman and R. B. Leachman, P-12, and G. Dearnaley, P-9.

"Li^7 + p Reduced Widths from Li^7(d, n)Be^8" by F. S. Dietrich and C. D. Zafiratos, both former P-DOR.

"Spectrophotometric Studies of 'Weak' and 'Strong' Discharges in He^3 Gas" by Jasper A. Jackson and Bob E. Watt, both P-DOR.

"Initial Experience with the LASL Tandem Van de Graaff" by Richard L. Henkel, P-9. (INVITED PAPER)

American Nuclear Society National Topical Meeting on Fast Reactor Technology, Detroit, Mich., April 26-28:

"Mobile Fueled Fast Reactors" by D. B. Hall, K-DO, and E. C. Kovacic, APDA.

Fifth Shock Tube Symposium, Washington, D.C., April 28-30:

"Time-Resolved Spectroscopy of Helium Emission in the High Explosive Shock Tube" by R. A. Jeffries, GMX-7; and L. B. Seely and R. G. Fowler, former LASL employees.

"Observation of the Vibrational Relaxation Zone of Shock Waves in Hydrogen and Deuterium by a Narrow Beam Schlieren Method" by John H. Kiefer and Robert W. Lutz, both GMX-7.

A one-time LASL staff member who has become a college physics professor brought his students to Los Alamos last month. Ben Hill, who was in T-11 for six years, joined the faculty of Southwestern State College in Weatherford, Okla., last August. In the photo, Hill (fourth from right) and his class hear an explanation of the Omega West reactor from Henry Motz (right), P-2 group leader. The visitors also went to several other technical sites and the LASL Museum.

Diamond, Pajarito Work Due

Two major road projects have been scheduled for Los Alamos this summer.

The AEC plans to complete its widening of Diamond Drive and realign and widen Pajarito Road where it descends into Pajarito Canyon near TA-18.

The Diamond Drive project will extend from Sandia Drive to 35th Street and will include widening the "fill" to accommodate another traffic lane. The grade will also be reduced near the Baptist Church. A duplex and a house are being removed at the Thirty-eighth Street intersection to make room for the wider right-of-way.

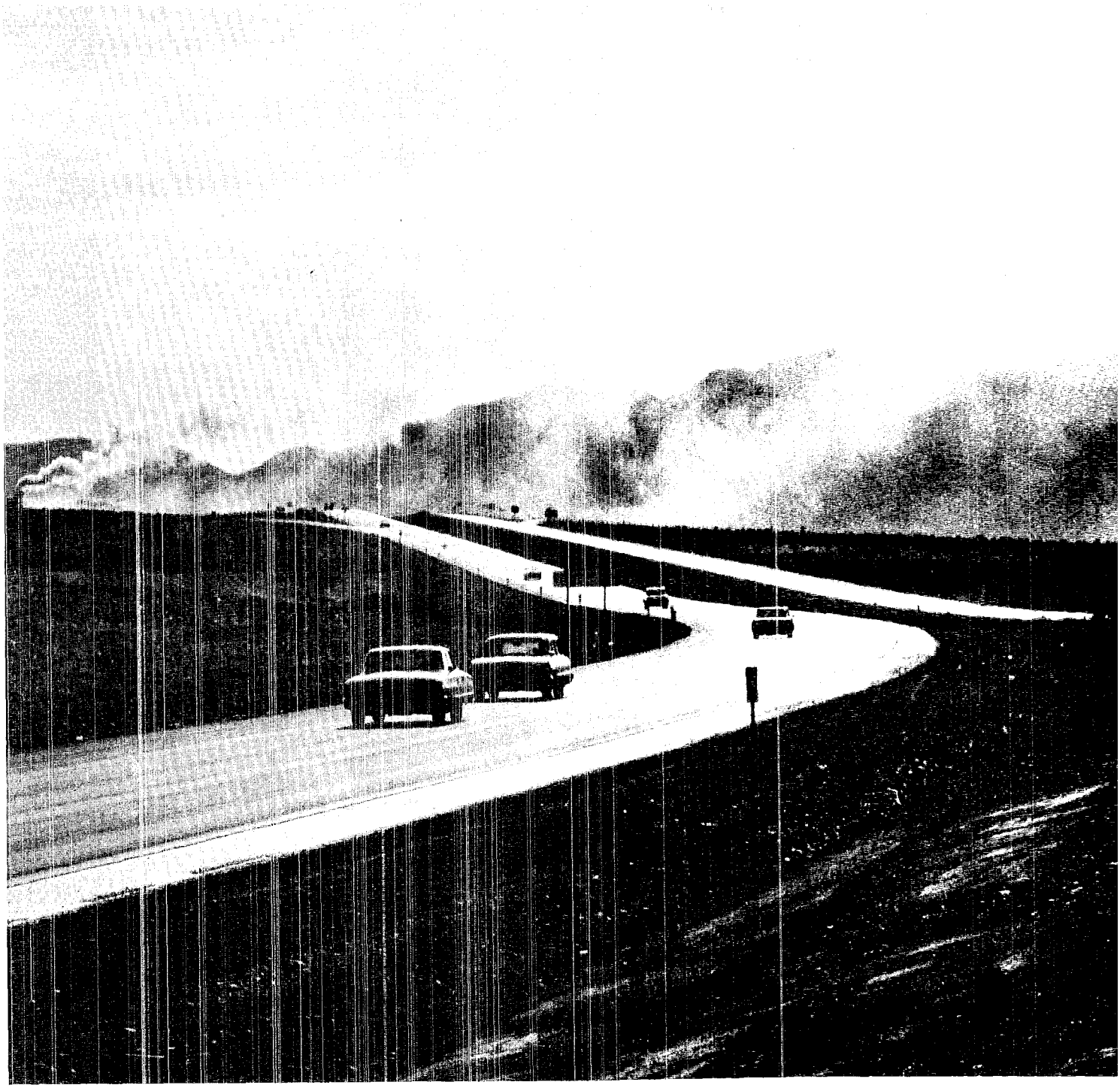
When completed next fall Diamond Drive will be at least four lanes wide for its entire length, from the Los Alamos Canyon Bridge to the Barranca and North Mesa access road forks.

On Pajarito Road the work will commence where it left off last year, near TA-46, and will continue to a new junction on the canyon floor. The project will require paring off cliffsides for construction of a new roadbed with a lesser grade.

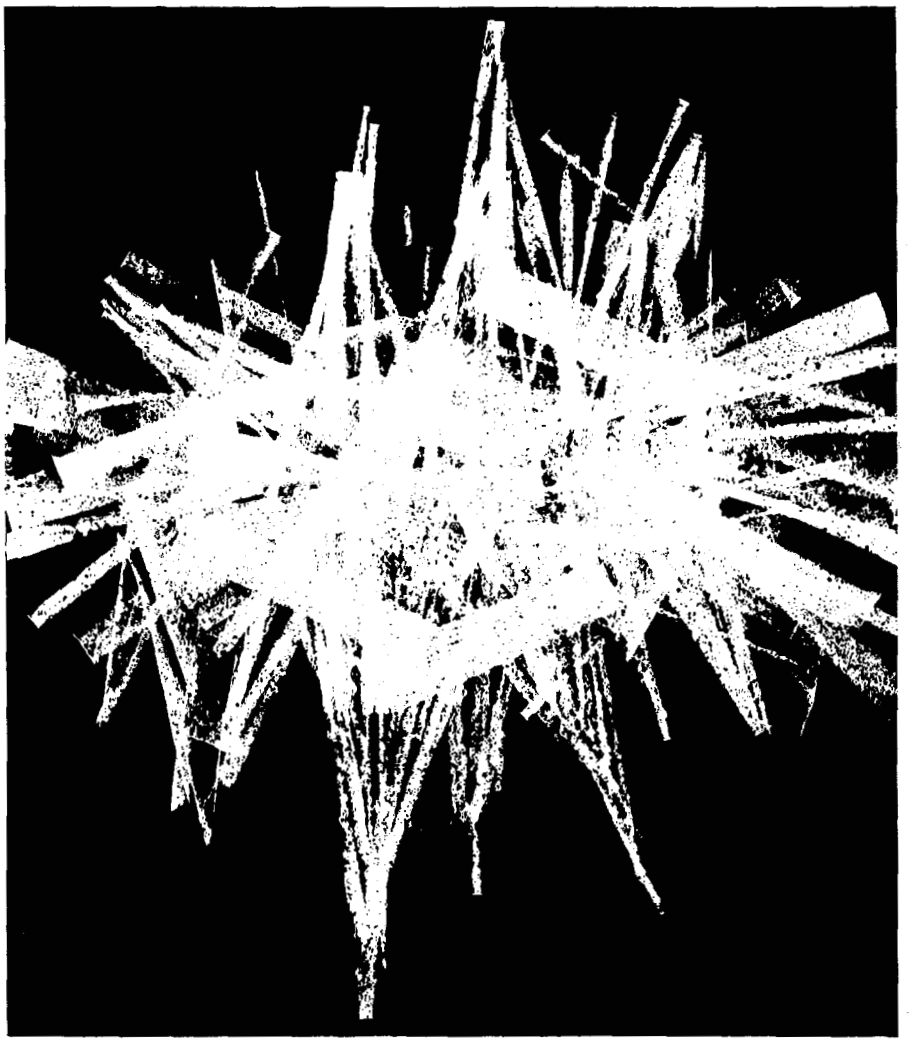
Coincident with the Pajarito Road construction will be the laying of a new water main. It is part of a long-range "loop" water service program that will ultimatedly tie the present Los Alamos community and tech area water distribution systems to a new well field under development in Pajarito Canyon.

Another major project this summer will be the installation of new water service laterals in Western Area.

AEC said the various construction jobs will cause some inconvenience in travel during the summer, and asked for patience. It is possible the Pajarito Road work will force closing of that busy White Rock-tech area route for perhaps two months. During that time traffic will be routed over the South Mesa Access Road.



Nevada Gov. Grant Sawyer dedicated the Las Vegas-Mercury Expressway on April 21, bringing true a dream of thousands of Nevada Test Site commuters. The new road follows the same route of the infamous two-lane "Widow Maker" that was simply overwhelmed by the tremendous rush-hour traffic flow between NTS and Las Vegas. The 50-mile highway once was the right of way of a railroad, but when bust followed boom in the Bullfrog District gold fields north of Las Vegas, the Las Vegas and Tonopah RR rails were taken up and the roadbed was purchased by the Nevada Highway Department for $3,899.44 and it became U.S. 95. That was circa World War I. The new highway, two years abuilding, cost the AEC, NASA and the state of Nevada a total of $10,000,000. Bill Regan's photo was taken near the northwest limit of the Expressway, at the interchange with the AEC roads leading to Mercury and the Nuclear Rocket Development Station within NTS. Dust cloud from construction firm's rock crusher is "smoke."



Interpretation by William Thonson

The Dynamic Radiography of Explosively Driven Metals

PROBLEM: The application of a pulsed radiation beam produced by a high current electron accelerator (PHERMEX) to the studies of the dynamic behavior and properties of matter in the severe environment of explosive detonations, where pressures may be measured in megabars. The radiographic diagnosis of shock wave interactions in metals, as well as features of the detonation waves in the explosive driving charges are of particular interest. The significance of such parameters as tensile strength and viscosity, in the high-speed dynamic realm, is sought. The formation, progress and effects of metallic jets are observed and studied.

Qualified applicants interested in research at Los Alamos are invited to send resumes to:
Director of Personnel
Division 65-53

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